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ABSTRACT

Since August of 1976, the Faculty of Nursing at the University of Calgary has developed and implemented a four-phase computer assisted instruction (CAI) project. In Phase I, the pilot project to demonstrate effectiveness of CAI as an alternative teaching strategy in that setting has been completed and replication is on-going. In Phase II, identification of areas in the curriculum which could be effectively taught using CAI is currently being surveyed; and an inventory of nursing-related CAI programs in North America is to begin in January 1978. In Phase III, acquisition of computer terminals for the Faculty of Nursing's Learning Resource Center has been accomplished; acquisition of CAI lessons from external sources is awaiting the completion of Phase II; and the development of CAI lessons is in progress. Preliminary discussions have taken place about the delivery of CAI-based courses for credit to nurses in rural Alberta; this will be Phase IV of the project. (VT)

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REPORT OF THE COMPUTER ASSISTED INSTRUCTION PROJECT IN THE FACULTY OF NURSING AT THE UNIVERSITY OF CALGARY

by

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IR 006 259

Report of the Computer Assisted Instruction Project in the Faculty of Nursing at The University of Calgary

1. INTRODUCTION

Approximately 18 months ago The University of Calgary, Faculty of Nursing decided to investigate the potential of Computer Assisted Instruction as an alternative teaching strategy for baccalaureate Nursing students. The impetus for this decision came from the report of The Alberta Task Force on Nursing Education. This report to the government of the province of Alberta recommended that, by 1985, authority to certify completion of a program in nursing and thus certify eligibility to write nurse registration examinations will rest only with the two University Schools of Nursing in the province and that by 1990 the minimum requirement for nurse registration should be the baccalaureate degree in nursing. The Task Force Committee further recommended that by 1985 there be two routes to professional nursing preparation: (1) a university-based baccalaureate program, and (2) an articulated baccalaureate program between a non-university setting and a university setting. To accomplish these goals The Task Force has urged the universities and non-university institutions to begin planning immediately for these changes (The Report of the Alberta Task Force on Nursing Education, 1975). It has been projected that by 1980 The University of Calgary, Faculty of Nursing will need to graduate 85 students per year and have a total enrollment of 470 students in order to meet The Task Force recommendation of the baccalaureate degree as the minimum requirement for the professional practice of nursing (Steed, 1976). This represents an increase within three years of almost 200 percent over present enrollment.

Since there are currently no students registered in Nursing Master's programs preparing nursing educators in Alberta, the pool from which to draw qualified faculty is limited. Therefore, there is a need to develop alternative teaching strategies, which facilitate the most effective, efficient, and appropriate use of existing faculty, while maintaining the quality of the programs.

2. PROJECT OVERVIEW

The initial project proposal was for a four phase plan. Phase I was to demonstrate the effectiveness of C.A.I. as an alternative teaching strategy in our setting. The objectives in this phase were:

(1) to evaluate the learning which occurred, the retention of learning and the transfer of learning to the clinical area;
(2) to evaluate the resources available from The University of Calgary Computer Services Division; and
(3) to evaluate the student's receptivity to this mode of learning.

Phase II of the proposal included identification of areas in the curriculum which could be effectively taught using C.A.I., development of a catalogue of available C.A.I. lessons in Nursing and integration of presently available C.A.I. lessons into appropriate locations in the

curriculum. In Phase III of the proposal, the goals were:

(1) addition of computer terminals to the Learning Resource Center;
(2) acquisition, purchase, and translation of additional C.A.I. programs from sources identified in Phase II;
(3) adaptation of programs identified in Phase II to meet the objectives of The University of Calgary Nursing curriculum; and
(4) development of additional new C.A.I. programs in nursing at The University of Calgary.

The fourth, or final phase of the proposal and the overall goal of the project consisted of developing and making available C.A.I.-based self study courses for nurses in rural Alberta by which credits towards the Bachelor of Nursing degree at The University of Calgary could be acquired.

A time line was not developed because the phases were conceptualized as being concurrent rather than sequential.

3. PROGRESS TO DATE (PHASE I)

Phase I of the project was begun in September, 1976 with funding from the Research, Policy and Grants Committee of The University of Calgary.

3.1 Methodology

Essentially, the methodology reflects an attempt to replicate the work of M. A. Bitzer (1966; Bitzer and Boudreaux, 1969) with the addition of a tool for evaluating transfer of learning to the clinical area. The population for the study was selected from among volunteer students in the first year of the baccalaureate nursing program at The University of Calgary. The volunteer pool of 35 students was randomly assigned to either the control or experimental group. The two groups of students were taught a unit on the common adaptation problems of Immobility from a Roy adaptation nursing approach (Roy, 1976). The first group of students, constituting the control group, was taught using traditional didactic methods, i.e., lecture-discussion, slides, textbook, illustrative diagrams. The second group of students, constituting the experimental group, was taught the same material using only the C.A.I. program (Bedrest). The computer program consisted of a tutorial program, situation simulation exercises utilizing branching logic, and feedback of corrective teaching to incorrect responses. The program was implemented on the CDC Cyber 172 using the BASIC language. The computer program and the didactic lectures were developed by the same person in order to maintain content equivalence between the two groups of students. The information content was assessed for equality in all aspects by a panel of faculty peers. The two groups of students were taught the units during the same period of time.

Initially, all students were given a teacher-made, paper and pencil multiple choice test (pre-test) consisting of 132 items in order to determine previous knowledge of the material to be covered. At the conclusion of the unit, a parallel, content-equivalent, multiple choice test (post-test) was administered to all students. The tests were given to both groups simultaneously and covered essential concepts and principles relating to the care of immobilized clients. Within one

week of completion of the units all subjects were asked to submit an evaluation from the clinical setting of their ability to integrate the principles into nursing care of clients. Thus, transfer of learning to the clinical area was to be evaluated. After six months both groups will be retested to evaluate retention of the information, again by a means of a paper and pencil multiple choice test administered simultaneously to all subjects and by clinical evaluation of all subjects within the same week.

Initially, it was proposed that the paper and pencil tests would provide a learning score for each subject. The mean score within the control group and the experimental group would be calculated and submitted to analysis of variance. Likewise the clinical evaluation instrument was to provide a raw score for each subject and a group mean, and also be submitted to analysis of variance. The assessment of retention would provide two scores (paper and pencil test and clinical evaluation) these were to be averaged to produce one score for each subject. The mean of the averaged scores for each group was to be calculated and subjected to analysis of variance. Thus, F values would be available for learning, for transfer, and for retention.

It was anticipated that the study would provide hard data to support or reject the hypothesis that both teaching methods are equal when total populations are considered. When $p < .05$ the hypothesis would be rejected.

3.2 Results

The lesson material used was readily adapted to this type of presentation. Few difficulties were encountered in the actual programming of the data. The original teaching logic required approximately two months to prepare, and an additional three weeks were required to prepare lesson material in a form suitable for the system. The time for preparation of lesson material could be reduced with experience. A few minor system failures did develop during the experiment, but generally were corrected immediately. However, an interruption of this type tended to create anxiety and frustration in the student. Student frustration also developed as a result of inaccessibility of terminals, since we were limited to use of ten public terminals which were shared with a student body of 16,319. The slow response time on the system was another source of student frustration. Generally, the student response to this learning strategy was highly favorable. Comments included: "a fun way to learn," "let's have more of this," "when will more course work be available on the computer."

An attempt to determine differences in the material learned by the two groups was done by using a t-test of the difference between pre- and post-test scores for the control and experimental groups. The mean score difference between pre- and post-test scores for the control group was 9.89. The mean score difference between the pre- and post-test scores for the experimental (C.A.I.) group was 15.88. This represents a difference of 6.99 between the two groups. This difference between the two groups is significant at the one percent level ($t = .017$) by a two-tailed test. A comparison of the students' Grade Point Averages (G.P.A.'s) for first year of the nursing program revealed no statistically significant difference

between the two groups of students. When a scattergram of score differences by G.P.A. was done, no significant trend was identified between the control and experimental groups for students with high G.P.A.'s. However there appeared to be a distinct trend among students with low G.P.A.'s but the total number of students in both the experimental and control groups with low G.P.A.'s was too small (6) to correlate statistically.

A number of problems were encountered in developing a criterion referenced clinical evaluation tool. Efforts to date have been concentrated on developing the tool and establishing its validity and reliability. Testing for retention of learning will be conducted in January of 1978.

3.3 Discussion

The availability of C.A.I. as an alternative teaching strategy within the Faculty of Nursing at The University of Calgary is consistent with the Faculty's belief that "learning can occur through self-directed problem-solving," (Statement on Learning and the Learner, Conceptual Framework, Faculty of Nursing, The University of Calgary, 1976). The results produced by this pilot study have been significant and as such have provided data which justify continued development of the C.A.I project as an integral part of the curriculum in the Faculty of Nursing. The data also indicate directions for further study, particularly in terms of the type of student who learns best using a specific learning strategy. This portion of the project will be replicated with a larger population and will include study of the transfer of learning to the clinical situation with the tool developed in this pilot study.

4. PROGRESS TO DATE (PHASES II, III, IV)

Phase II (which was to identify areas in the curriculum which could be effectively taught using C.A.I. and to identify C.A.I. lessons in nursing available from other sources) is presently in the initial stages. The curriculum blueprints are being studied and learning modules are being developed in several courses. C.A.I. has been introduced as an integral portion of selected courses (as opposed to a research or add-on approach). We anticipate undertaking, shortly, a survey of all baccalaureate Schools of Nursing in Canada and the United States to inventory nursing C.A.I. and the willingness to exchange lessons.

Phase III, acquisition of terminals for our Learning Resource Center has been accomplished. The terminals are either in place in the Learning Resource Center or on order with delivery anticipated momentarily. The acquisition of lessons from other sources has not begun because the inventory of lessons (in Phase II) is incomplete. New lessons are under development by several faculty members. While this development might not result in highly sophisticated lessons, in the process the faculty is acquiring experience which, hopefully, will develop into sophistication and expertise.

Preliminary discussions have been undertaken with one of the local hospitals regarding Phase IV. The discussions have centered around the philosophy which will underlie a delivery mechanism for C.A.I.-based courses for credits towards the baccalaureate degree in Nursing at The University of Calgary.

SUMMARY

Since August of 1976, the Faculty of Nursing, The University of Calgary has developed and implemented a four phase, C.A.I. project as follows:

Phase	Goal(s)	Progress
I	Demonstrate effectiveness of C.A.I. as alternative teaching strategy in our setting.	Pilot project completed. Replication on-going.
II	1. Identification of areas in curriculum which could be effectively taught using C.A.I.	Currently being surveyed.
	2. Inventory of Nursing related C.A.I. existing in North America.	To begin January, 1978.
III	1. Addition of computer terminals to Faculty of Nursing, Learning Resource Center.	Accomplished.
	2. Acquisition of C.A.I. lessons from external sources.	Awaiting completion of Phase II, Goal 2.
	3. Development of C.A.I. lessons by The University of Calgary, Faculty of Nursing.	In progress.
IV	Delivery to nurses in rural Alberta of C.A.I.-based courses for credit towards the baccalaureate degree in nursing at The University of Calgary.	Preliminary discussions re delivery mechanism undertaken.

References

Bitzer, M. A. "Clinical Nursing Instruction Via the Plato Simulated Laboratory," Nursing Research, Volume 15, No. 2, Spring 1966, pp. 144-150.

Bitzer, M. A. and M. C. Boudreaux. "Using a Computer to Teach Nursing," Nursing Forum, Volume VIII, No. 3, 1969, pp. 234-254.

Report of the Alberta Task Force on Nursing Education. Department of Advanced Education and Manpower, Edmonton, Alberta, 1975.

Roy, Sister Callista. Introduction to Nursing: An Adaptation Model. Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1976.

"Statement on Learning and the Learner," Conceptual Framework. Faculty of Nursing, The University of Calgary, Calgary, Alberta, 1976.

Steed, M. Response to the Report of the Alberta Task Force on Nursing Education. Faculty of Nursing, University of Alberta, Edmonton, Alberta, 1976.